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Soil Conservation

JULY 1965
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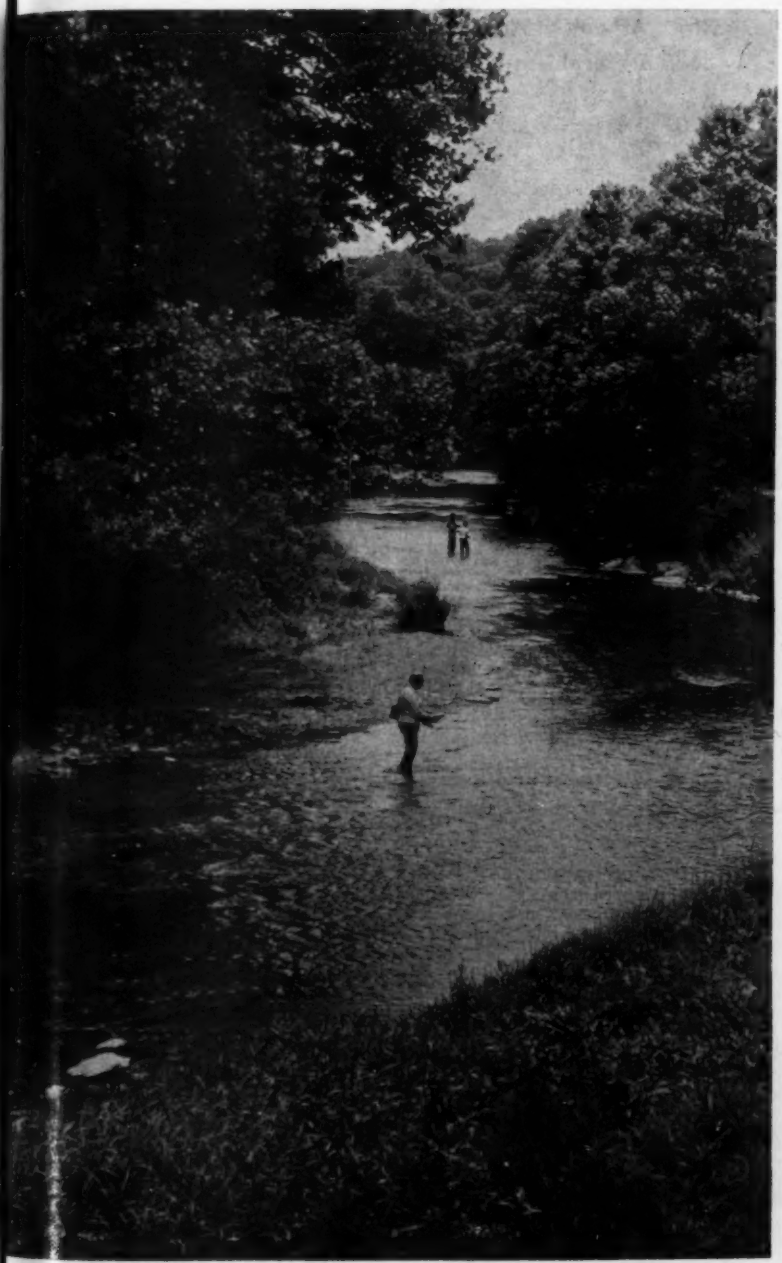

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SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE

JULY 1965
VOL. XXX, NO. 12

Soil Conservation

Regional . . .

"Each acre according to its needs and capabilities" has been the tenet of conservation planning since the first days of SCS.

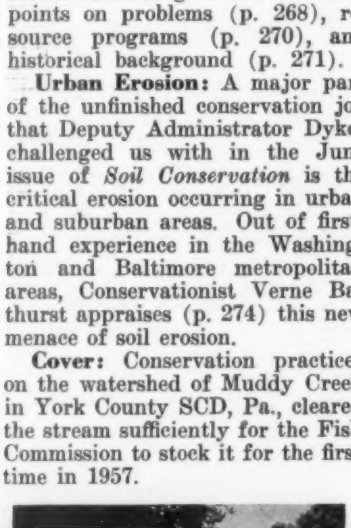
As planning horizons broadened from the separate fields of individual farms to entire watersheds and larger areas, the principle of fitting every plan to a specific area has continued to be our guide.

First, the Great Plains Conservation Program, and now the Appalachian Regional Development Act, extend this principle to broad governmental action aimed at unique regional problems.

For an insight into the character of the land and people of Appalachia, we asked veteran conservationists to give us local viewpoints on problems (p. 268), resource programs (p. 270), and historical background (p. 271).

Urban Erosion: A major part of the unfinished conservation job that Deputy Administrator Dykes challenged us with in the June issue of *Soil Conservation* is the critical erosion occurring in urban and suburban areas. Out of firsthand experience in the Washington and Baltimore metropolitan areas, Conservationist Verne Bathurst appraises (p. 274) this new menace of soil erosion.

Cover: Conservation practices on the watershed of Muddy Creek in York County SCD, Pa., cleared the stream sufficiently for the Fish Commission to stock it for the first time in 1957.



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SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

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A Look at Appalachia

Another special regional plan for resources

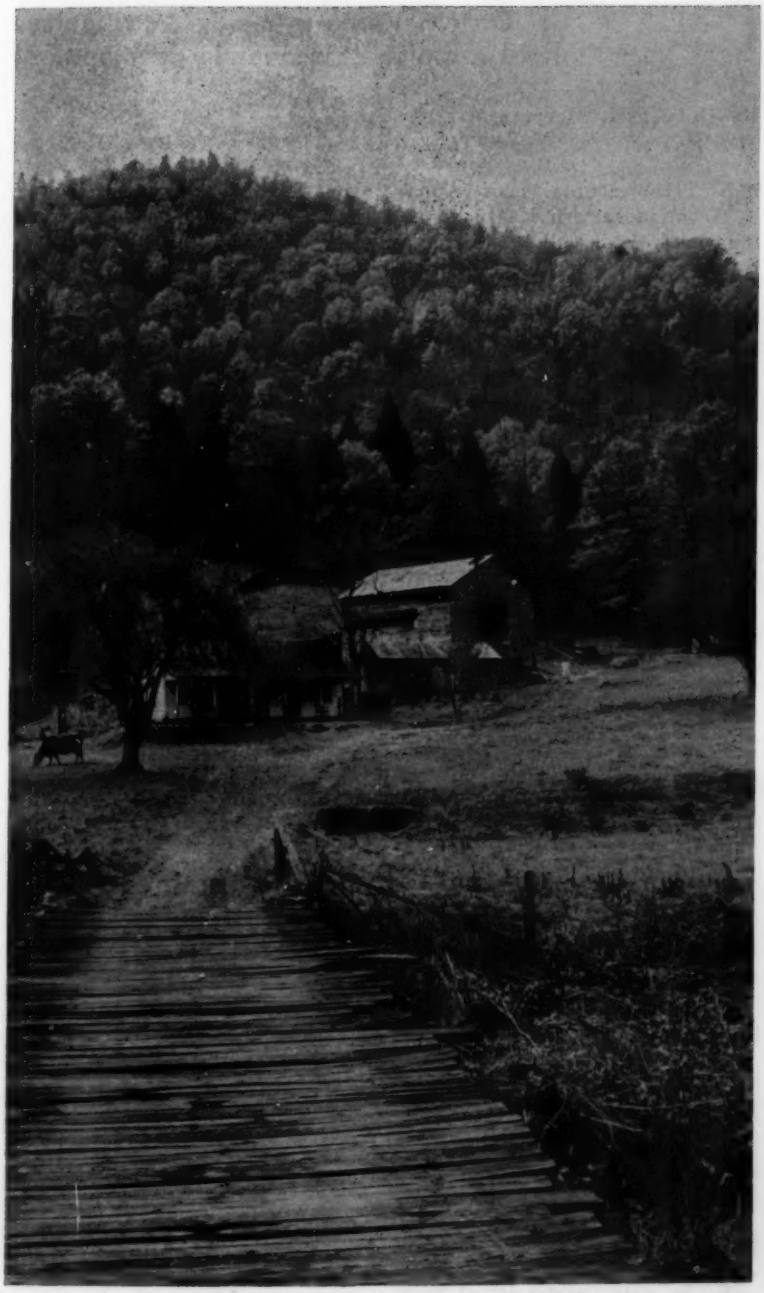
AS THE newly formed Appalachian Regional Commission forges ahead in implementing the Appalachian Regional Development Act of 1965, the Soil Conservation Service, like other Federal agencies, is reexamining its programs and activities to mesh them with the total effort for economic betterment of the region.

Soil conservation districts, as local units of government responsible for resource conservation and development, also are reviewing their programs in the light of new goals and new sources of outside assistance.

The districts will join with State agencies in making plans to use the provisions of the act to local advantage. The Commission, composed of the 11 Governors or their designees and a Federal cochairman, is the general planning and coordinating body.

SCS has unique experience in administering a regional resource conservation and development program. The Great Plains Conservation Program, initiated in 1957, set a precedent for the regional approach to alleviating unique regional resource problems. Soil conservation districts in the Plains provided effective local leadership in that program.

In the following pages, key SCS conservationists in three States provide a firsthand look at the peculiar conditions, problems, and aspirations of Appalachia that make a parallel regional program appropriate for another distinctive part of the country.



A Look at Appalachia . . .

Its Problems

Eastern Kentucky's abused resources hold promise of economic development

By Robert H. Marcum
Area Conservationist, SCS, Hazard, Ky.

IN THE mountains of Appalachia in eastern Kentucky an undernourished child sits in a dreary one room school writing an essay on soil and water conservation.

After school she trudges home—the bridge is out since the last flood—across streams filthy from coal washings and smelling of dead fish killed by mine acids. She walks a steep mountain path over eroded fields to a squalid house, to home overlooked by raw mountainsides raped by giant coal augers and bulldozers.

Does she see the examples all about her of the subject of today's lesson—the need for soil and water conservation? The lessons are there to see by those not inured by lifelong familiarity.

Steep and Rough

The Eastern Kentucky Appalachian area consists of winding narrow valleys, steep mountains, and peaked ridgetops ranging to above 4,000 feet in elevation.

Forty-nine counties of Kentucky are included in the Appalachian Region defined by the Appalachian Regional Development Act. Thirty-five of these are considered as the heartland of Appalachia and typify its conditions.

Timber is a major crop in Appalachia, but much of the second-growth forest is of low quality.

Sediment deposited on valley farmland speaks eloquently of the erosion of hillside fields.

These 35 counties have a land area of 7.5 million acres, of which 52 percent is in farms. Present land use of the area as a whole is about 9 percent cropland, 7 percent grassland, 73 percent woodland, and 11 percent other uses. The Conservation Needs Inventory indicates there will be a further decrease in cropland and an increase in woodland by 1975.

Most of the soils are derived from sandstone and shale. Those on steep upland slopes are very thin and suited mainly to the production of wood crops. Soils on the toe-slopes are suited to grassland. Land suitable for regular cultivation is confined to the narrow

bottom lands along the streams.

The median-size farm is 55 acres, of which 10 acres is cropland, 8 acres pastureland, 28 acres woodland, and 9 acres idle or in farmstead.

The ownership pattern varies from small holdings to large acreages owned or leased by land companies. Many of the farms are classed as "low subsistence" type units. Of the 33,777 farms in the area, 30,134 have a total gross annual income of less than $2,500.

The limited amount of land suitable for cultivation and the steep topography generally prevent the use of modern farm machinery. The combining of small farms into larger commercial units is usually impractical because the small areas suitable for cropland and grassland are widely scattered.

A load of cane on the way to the home-operated sorghum mill for processing into sirup is typical of operations on Appalachia's many small farms.

Erosion Serious

Serious erosion problems exist on approximately a million acres. Erosion control is needed on 225,000 acres of cropland, 416,000 acres of woodland, 482,000 acres of pastureland, and 32,000 acres of other land.

Fish kills commonly result from acid mine water, industrial pollutants, and municipal wastes (photo courtesy of Kentucky Department of Fish and Wildlife Resources).

Opportunities for off-farm employment have become more limited each year of the past decade. Industry has not moved into the rural areas, and the coal miners have been displaced by machinery.

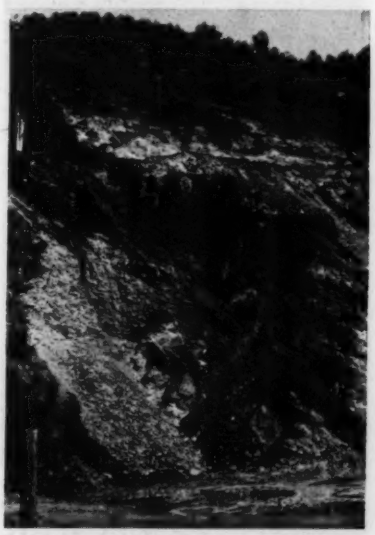
Water is a curse and a blessing to Appalachia. In January 1957, southeastern Kentucky sustained property damages in the millions of dollars, and 12 lives were lost. Another major flood occurred in 1963 with heavy property damage and loss of 3 lives. Less spectacular flooding happens every year along the smaller tributaries and creeks. Cropland along streams is often damaged by deposition of undesirable material or by deep scouring when a stream jumps its banks.

Many stream channels are choked with sediment from strip mine areas, farmland, and roads. Numerous streams are polluted by mine acids and spoiled through use as garbage dumps.

Flooding and poor quality water are symptoms of problems relating to land misuse, abuse, and poor cover.

With more than 80 percent of the land best suited for growing

(Continued on p. 282)



A mining spoil dump leaves debris exposed to the erosive action of rains.

A Look at Appalachia . . .

The Program

Georgians expect 1965 Appalachian Act to speed up area's resource conservation

By Robert W. Oertel
Assistant State Conservationist, SCS, Athens, Ga.

DISTRICT supervisors in eight soil and water conservation districts in northern Georgia expect the Appalachian Regional Development Act of 1965 to help them speed up the conservation and development of soil and water resources. Title II of the act is of particular interest to them.

Section 201 provides for an Appalachian Development Highway System; section 203 for Land Stabilization, Conservation, and Erosion Control; section 204 for Timber Development Organizations; section 205 for Mining Area Restoration; and section 206 for a Water Resource Survey. In addition an accelerated watershed program will help the districts to meet the objectives of the act.

Watershed projects are already bringing multiple benefits to Appalachian communities. The water resource survey provisions of the Appalachian Act will speed planning of new projects.

Although blessed with bountiful rainfall, the entire Appalachian area badly needs improved water management. Only careful development of this rich resource can prevent flood damages and insure an unfailing year-round water supply to meet municipal and industrical requirements.

North Georgians have learned quickly that watershed projects produce multiple benefits for entire communities. As a result, interest and activity of local people have mushroomed. Projects are in some stage of planning or operation in every one of the 35 Georgia counties in the Appalachian area. Three projects have been completed, 13 are under construction, and 8 are in the planning stage.

Twenty-four applications for initial investigations and surveys have been approved by the State Soil and Water Conservation Committee. These and 63 others from the remainder of the State await planning authorization.

Twenty-seven towns in 18 watersheds in Appalachia have requested assistance in providing additional municipal water storage for present and future use. Some of these are being planned, and others are awaiting this assistance.

Small subsistence farms are crowded into narrow mountain valleys between wooded hills.

Although progress has been good, leaders agree that time required for surveys and work plan development slow down the watershed program. It is during this process that local sponsors find out whether their problems can be solved by a watershed project. Only after acceptable work plans are completed can the project proposals be forwarded to the Department of Agriculture for approval and commitment of Federal funds for construction.

Within the total 11-State Appalachian Region there are 66 watershed projects under construction, 38 authorized for planning, and 70 unserviced applications. The

water resource survey should help relieve some of this backlog.

Successful watershed projects result only where a complete program of land treatment is coupled with structural measures. The limited economic resources of most landowners in the Appalachian area delay the application of needed land treatment measures. The Land Stabilization, Conservation, and Erosion Control section of the act will enable the Federal Government to contract with landowners to establish some of the needed measures on a maximum of 50 acres on each farm.

The contract feature assures landowners that sufficient financial assistance will be available to install the conservation practices covered. It would also insure the Federal Government that the land treatment program would progress in an orderly fashion to achieve maximum effectiveness of the total watershed program.

Roadside stabilization has long been one of the major objectives of soil and water conservation districts. Naturally the supervisors are keenly interested in the Appalachian Development Highway System portion of the act. They express hope that it will enable them to speed up their efforts to stop harmful erosion on all roads in their districts and provide needed access to areas which have not been readily accessible.

Ben Overstreet, chairman of the Chattahoochee River Soil and Water Conservation District and a long-time advocate of watershed development, summed up the attitude of conservation leaders toward the Appalachian Act:

"District supervisors have been pushing hard for a long time to develop the soil and water resources for the benefit of all our people. If the Appalachian Act will enable us to move closer to that goal, we'll take advantage of it to help us carry on our district programs." ♦

A Look at Appalachia . . .

In Perspective

West Virginia flashback traces ebb and flow of people and prosperity in highland area

By Glendon P. Burton and Ross Mellinger
Area Conservationist, SCS, Parkersburg, and Woodland Conservationist, SCS, Morgantown, W. Va.

LET'S take a trip into a part of Appalachia from the junction of the Little Kanawha and Ohio Rivers at Parkersburg, W. Va. Our flashback in time will take us over 165 years of land use history in one of America's unique resource regions.

Starting about 1800, we join up with the first settlers traveling by boat and on foot eastward along the Little Kanawha River and its tributaries into Wood, Wirt, Ritchie, Calhoun, and Roane counties. They gain footholds in the wilderness along the stream.

When their first rough shelters are built, they spread out from the stream bottoms to conquer the hills. Their growing families and improving markets for food and timber force them to clear the steep hillsides. They find the soil is good. They can grow corn, wheat, hay, and pasture.

Industrial Boom

In the 1860's, the discovery of oil at Burning Springs, Wirt County, sets off a booming oil and gas industry. Oilfield workers establish homesteads farther back in the hills. There is soon "a family in every hollow."

Oil did for the Kanawha River area what coal mining did to much of the rest of Appalachia—stimulated an industrial development that left its workers stranded when the resource faded.

Soon lumberjacks move in with axes, saws, and oxen to move the timber to the streams. Trees that can't be sold for timber are "log rolled" and burned. Leases to clear land for "three crops of corn" are common.

Food must be grown for home use and for barter; woodland must be changed to pasture to grow cattle and sheep. There is no corner grocery store or supermarket. This is a period when each farm is nearly a self-sufficient unit. The land responds to human

The first pressure of settlement cleared away the forests and pushed farming up the steep hillsides.

A new generation of wood-using industries is based on the region's second-growth timber.

needs—but at a price.

During World War I more steep land is plowed for grain. Farmers soon begin to notice that the plow often strikes rock where it didn't before. Are the stones growing out of the soil?

Price of the Plow

Parts of the field are now red instead of brown and the corn doesn't grow well there. Gullies begin to appear. Even when plowed in or filled with stones, they soon wash out again.

Pasture fields don't "green-up" as early in the spring; strange grasses and weeds begin to replace bluegrass. On steep slopes the land begins to slip and slide in large chunks.

The streams run muddy red after hard rains, and they completely dry up in the summer. Dug wells have to be dug deeper. What is happening to the land and water?

This is a period of large farms for hill country. Many are 200 acres or more. Wheat and oats are often cradled on fields too steep for a binder. Corn is the big grain crop. Hillside plows and sure-footed teams make it possible to plant the steepest slopes. The average "mechanized" farm of this period has a team of horses, hay rake, two-horse mowing machine, a wagon, and a sled.

This is truly the time of the family farm. The whole family works from dawn to dusk. But it is not an unhappy time. Neighborly visits; exchange of labor at harvest time; Saturday night in town; Sunday at church; husking bees; homecomings; picnics and political rallies—these provide social contacts and recreation.

The Weary Road

Roads are a real problem. The soils contain heavy red clay; slips and slides are common. From early November 'till the first of May, travel for any distance is a major task. Horses sink to their knees and wagons to the axles when the ground softens. A hard road is a rare treat for the mud-weary traveler.

Following the "big family" period, farms become smaller. Land is being divided up among heirs, until in the 1930's the average-size farm is about 100 acres. About 30 acres is woodland; the other 70 equally divided between pasture and former cropland used as meadow. Farmers have a subsistence level of living, but wants are few and some folks comment that they made it through the depression years by "lack of expense."

Soils are impoverished and eroded; livestock prices are riding the bottom; there is little incentive for farmers to invest in large scale soil improvement measures. In fact, it is almost impossible to find the money, no matter how attractive the promised returns. Yet this period spawns the soil conservation program and the concept of "using land within its capabilities and treating it according to its needs for protection and improvement."

Exodus Begins

During and after World War II, the rapid expansion of industry creates new jobs. Young people leave the farm. The old folks pass away or retire, and many farmsteads are abandoned. Population declines rapidly, and the land starts to revert to its original state of the 1800's—timber.

The farmers who stay see that it takes more and better land, more intensively used, to survive.

Mechanization joined with modern soil conservation techniques turn the trick. But only a few farms can do this because the kind of land needed is scarce.

Now, on long weekends the children and grandchildren return to the old homestead, driving late model cars. The young people left Appalachia to earn their way in industrial areas of the Piedmont and East. There they established a reputation as excellent workers in industry.

A few small industries appear in Harrisville, Grantsville, Elizabeth, and Spencer—clothing, rubber goods, metal fabrication, and wood products are manufactured. These help utilize the skills of local people, but there is still a surplus of labor and the better

opportunities for ambitious young people lie elsewhere.

In the 1960's, local leaders begin to study their communities and themselves. They realize that the vision of large industries, employing thousands of people, appearing back in the hills, as if by magic, is only a dream. They agree that progress must come mostly from conservation and development of the region's natural resources, supplemented by small industries where possible. They adopt the "drop your bucket where you are" philosophy.

Wood Is Hope

With 68 percent of the land now in woodland and with 1.73 billion board feet of timber on good timber-growing soils, wood-using industries are developing. Pulpwood is being produced from the pine that sprang up on the old crop fields. Trees are being planted. Sawmills and wood-treating plants are starting to utilize the hardwoods. The idea of tree farming for continuous production is catching on.

In the 1960's, soil and land use problems are still present. After heavy rains, the streams still run red. We see raw, eroded areas in overgrazed pastures; slips and slides on hillsides; eroding road banks and streambanks.

Here and there, as we get close to Parkersburg, we see erosion problems created by ill-planned housing developments as the city moves to the country.

We see thousands of acres of rough, unstable land gradually being taken over by low-value trees and brush. We wonder if good trees will be planted on these areas before it is too late and too costly.

Roads are still a problem. Designed to "get farmers out of the mud," hard tops were put on old roadways. They are not suitable for high speed travel and heavy loads. Bridges are small and posted with low load limit signs. We wonder how heavy wood products can be moved to market over these inadequate roads and bridges.

Where roads are good, people who like rural living locate homesites. Some are factory workers in plants along the Ohio River. Some are retirees. Some are former residents returned to the scenes of their childhood. Where roads provide quick transportation, they prefer to live in the country.

Beauty Beckons

The great natural beauty of this land in the spring, summer, and fall beckons the vacationer. The Little Kanawha River is noted for its bass, muskies, and big catfish. In the woodlands, squirrels, grouse, and deer are plentiful and on the increase. A good boating pool is located behind the Elizabeth Dam. All of these things, plus many other outdoor activities, are recreational opportunities yet to be fully developed.

We wonder what it's going to take to effect the conservation and development of natural resources necessary for better living in this part of Appalachia.

Landowners cooperating with soil conservation districts have succeeded in curbing erosion and improving land use on individual properties. Some with adequate land resources for profitable agriculture have found a measure of security. But not more than 50 percent of the land has been placed under safe and profitable conservation management.

A small watershed project on Bonds Creek provides protection to valley farmers and recreation facilities for the city of Pennsboro, but its 9,435 acres is just a patch on the mountainous terrain needing such coordinated planning and treatment.

Currently, committees of local leaders are exploring the possibilities of a Resource Conservation and Development project for five counties under the Department of Agriculture program administered by the Soil Conservation Service.

And now, the Appalachian Regional Development Act offers promise of new aids for building a stable economy on the region's natural resources.

Of one thing we are sure—the land endures and if the people put their minds and hands to it, they can fashion a good life in Appalachia. ♦

Cooperators with soil conservation districts have succeeded in establishing stable farm units.

Building sites left exposed during construction dump tons of sediment into suburban streams.

Soil Erosion in Urban Areas

Old problem takes a new form as bulldozer replaces the plow in land destruction

By Verne M. Bathurst
Assistant State Conservationist, SCS, College Park, Md.

VALUABLE surface soils have been washing into America's streams, rivers, and harbors ever since the earliest colonial clearings of forest and field. Soils that were many centuries in forming were eroded away in a single rainstorm because of improper land use and inadequate protective programs.

The erosion crisis, which in the 1930's spurred a vigorous soil conservation effort, today is moving from the Nation's farmlands to its rapidly growing urban and suburban areas. The builder's bulldozer bids fair to become the modern successor to the farmer's plow as the instrument of soil destruction.

Soil conservation districts now include 94 percent of the land in farms. Although rural land treatment is far from complete—the Conservation Needs Inventory estimates it as adequate on about one-third the non-Federal acreage—the spread of conservation practices and the trend away from cultivated crops in many sections of the country are stemming the inroads of erosion on farmlands.

Land in Transition

But soil stripped of its natural cover and inadequately protected against erosion remains a source of sediment threatening many watersheds. The problem is especially acute in that hazy zone between the open country and completely built-up urban centers.

In countless American suburbias the land is being peeled of its surface soil and left to erode, to clog drainage systems, and pollute streams.

"Some of the worst erosion on sloping land in the United States is around our growing metropolitan areas where grass, trees, and shrubs have been scalped from the land, unnecessarily, and the land left exposed until the lots are sodded as the last part of construction," according to Dr. Charles E. Kellogg, SCS deputy administrator for Soil Survey.

Studies made in the metropolitan areas of Washington, D. C., and Baltimore, Md., describe the twin problems of erosion and sedimentation which are common to many rapidly developing communities throughout the Nation.

Sedimentation is pronounced in the Potomac River basin which President Johnson has designated to be made a model of conservation and beautification.

Sediment in the Potomac

Sediment discharge in the Potomac River basin ranges from 21 to 2,300 tons a year for every square mile of drainage area, studies by the Interstate Commission on the Potomac River Basin show. In some places near Washington, sediment is more than 9 feet thick at the bottom of the Potomac. An estimated 2.5 million

tons of sediment is deposited annually at the mouth of the river. Much of it comes from nearby urban and highway construction areas.

The urbanized downstream two-thirds of Rock Creek watershed in Montgomery County, Md., and the District of Columbia contributes an estimated 29,000 tons of sediment annually, even after the sharp reduction in erosion following development. Fully 93 percent of this sediment is transported to the Potomac River.

SCS engineers and soil scientists estimate that the Patapsco River at Baltimore carries 600,000 cubic yards or nearly 500,000 tons of sediment into Baltimore harbor each year. The cost of dredging the harbor channels amounts to $100,000 a year.

Damage caused by sediment to commercial and sport fishing and to the oyster beds of the Chesapeake Bay has not been measured. Biologists and fish and wildlife experts say it amounts to millions of dollars.

Building Speeds Erosion

The Northern Virginia Soil Conservation District has reported that the annual sediment discharge into Bull Run, which drains a watershed in Fairfax County where intensive urban development has not yet begun, is 146 tons per square mile of watershed. The discharge rate for Difficult Run, where urbanization has begun, is 380 tons, and for Accotink Creek, where urbanization is well under way, 690 tons.

Residential construction has caused about 25,000 tons of sediment to be deposited in Lake Barcroft in Fairfax County each year for each square mile urbanized, or 39 tons an acre, according to the district's study. The capacity of the lake has declined by 12 percent since 1950.

Urbanization need not, of course, contribute to excessive soil erosion and sedimentation. At Loch Raven and Prettyboy reservoirs in Maryland, which serve the city of Baltimore, sedimentation rates dropped substantially when large acreages in these watersheds were converted from agriculture to residential and other nonfarm uses, with proper precautions against erosion in the process.

The land use changes in the watersheds were scattered, and plant cover was largely preserved. Much of the land kept in farms was placed under conservation plans. As a result, erosion was reduced 56 percent in Prettyboy watershed and 70 percent in Loch Raven watershed. Forests owned by the city of Baltimore that border the reservoirs trap some sediment before it reaches the water storage areas.

In contrast, at Lake Barcroft urbanization was more abrupt, and large areas had no plant cover for periods ranging from 3 months to 3 years. Construction was concentrated near the reservoir, so that almost all the eroded soil became sediment.

There can be more Loch Ravens and fewer Lake Barcrofts as intensified urban development affects more of the American landscape, for effective controls are possible against the twin evils of erosion and sedimentation. But they will be applied only where there are thoughtfulness on the part of developers and property owners and determination on the part of an interested public. ♦

The 30-inch storm sewer was too small to carry intermittent runoff from a small watershed draining into Lake Barcroft in Virginia. The sediment and erosion debris from construction sites have spoiled a choice recreation spot.

Continuous cropping with one type plant favors buildup of soil-borne fungus diseases, so rotate with unrelated plants. ♦

Maryland Urban Farm Th

Double Du

WHEN diminishing farm profits and rising urban taxes threatened the existence of Mrs. William B. Howard's Olney Farm near Bel Air, Md., she decided to combine outdoor recreation with grassland farming to bolster farm profits.

After 4 years of supervising a summer day camp and giving riding lessons, in addition to operating a 250-acre farm with one of the county's largest sheep herds, Mrs. Howard reports her double-duty farm experiment a success.

"Most things on our farm have at least two uses," says Mrs. Howard. The sheep furnish wool and meat. Ponies are the main attraction for our day camp and bring good sale prices. Our pastures

Proper pony care includes saddling and grooming as carried out above by students at the Olney Farm day camp. Pupils also learn to ride and jump ponies. Mrs. Harriet Howard, below on tractor, manages the 250-acre sheep and pony farm and spends many hours in the field with farm helpers.

e Du Land Use

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Mrs. Ho- or her long-range farm planning.
wool and A half-acre pond provides irri-
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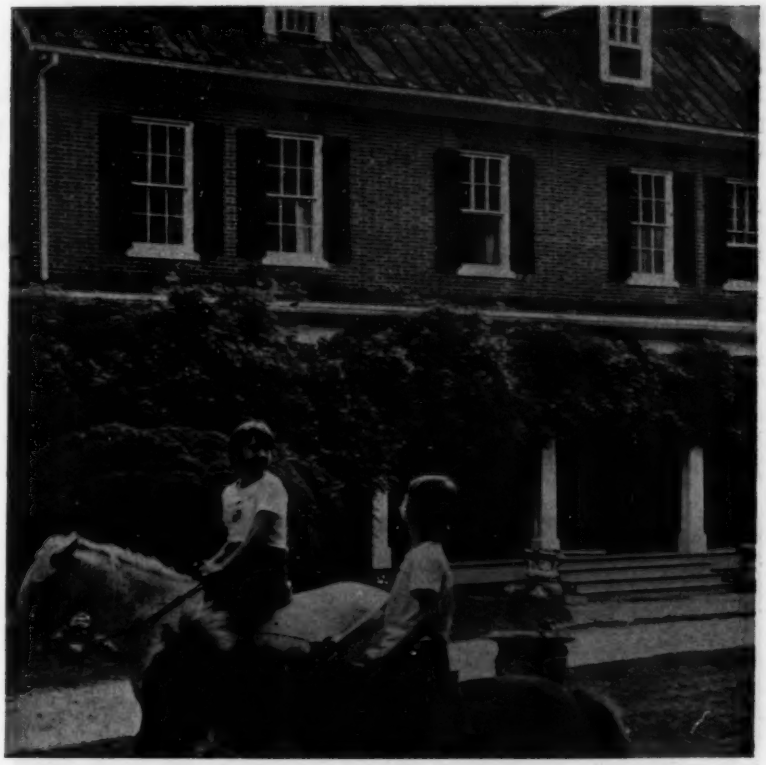
and bring egetable garden and fire protec-
pastures ion for the picturesque farm



This historic old Olney Farm house, above, is a center of activity. Two day camp pupils are shown heading for the riding ring where they learn horsemanship. At left, day campers get an hour and a half of swimming daily under the training of Mrs. Ann Knisely. Below, a few of the 100 or more sheep that roam the farm. Most are Hampshires.

home and nearby stables. Sixty-five acres of improved pasture provide feed for the sheep and ponies. Mrs. Howard rents additional pasture and hay land to insure ample forage for her livestock.

A 100-acre woodlot, thinned to produce better timber, has numerous riding trails for day camp use. Small erosion-prone areas, not suited for pasture or hay land, have been planted with pine seedlings and wildlife food-producing shrubs.

The family garden, managed by one of Mrs. Howard's dependable helpers, keeps the farm well supplied with fresh, canned, and frozen vegetables most of the year. Three milk cows, a few black Angus cattle, and some chickens make the farm nearly 100-percent self-sufficient.

The summer day camp is the big recreation feature on Olney Farm. Each year a limit of 35 children, 6 to 15 years of age, enlist in the 6-weeks' session.

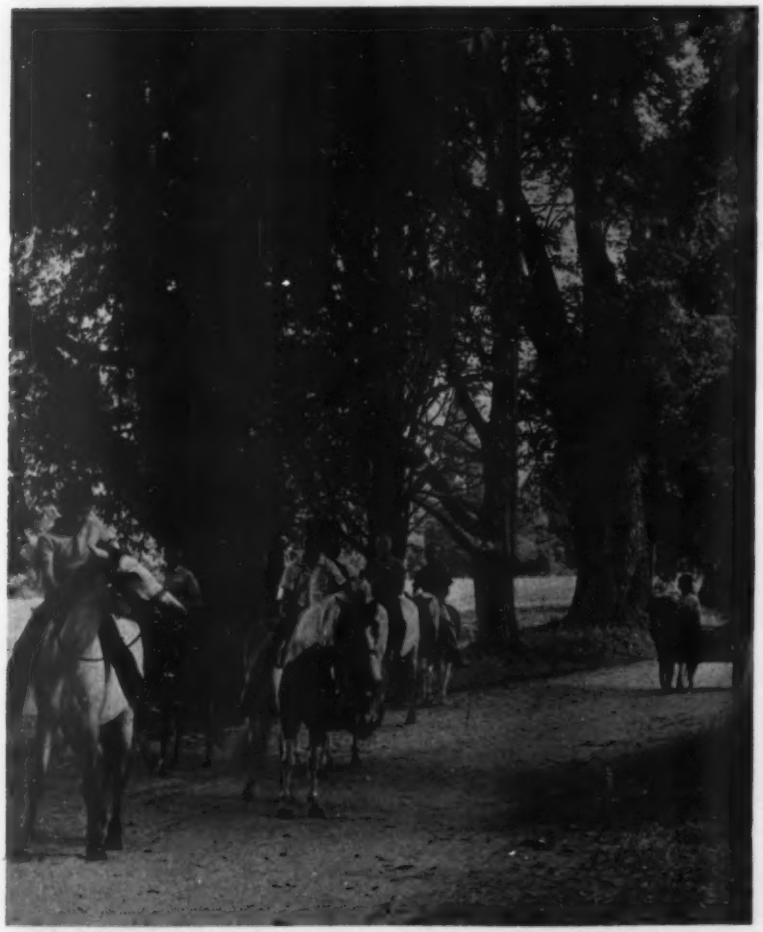
Mrs. Howard, an expert in horsemanship, supervises the camp with help from her daughter, Mrs. Frances Demme, and daughter-in-law, Mrs. Amabel Howard. Mrs. Ann Knisely, of Bel Air, supervises a change-of-pace swimming class for the day campers. Seven teenage counselors, mostly graduates from the camp, round out the staff.

James A. Seaman, SCS conservationist, and Mrs. Howard look over Olney Farm conservation plan. Mrs. Howard is a Harford Soil Conservation District cooperator.

"The schedule is geared to give the children plenty of action. They learn to catch, clean, saddle, ride, and jump the ponies," says Mrs. Howard. "And, they get expert swimming and diving lessons in our pool."

Looking to the future, Mrs. Howard plans to build a new riding ring, enlarge the farm pond, and add more conservation measures to keep the farm productive and protected.

"Seems like I teach riding all day and farm after 4 p.m.," said Mrs. Howard, "and it's like a three-ring circus here . . . but we enjoy it, and it all adds up to a good way to build our farm income." ♦



The shady entrance lane at Olney Farm is ideal training ground for day campers. Proper open road riding is taught in this session.

Cropland Conservation

Cropland conservation requires combinations of enduring land-improvement measures and recurring cultural and management practices. Seldom will either type of treatment suffice alone; usually both need to be used together. ♦

Grazing Native Grass Proves Conservation Use of Fresh Marsh

By Thomas N. Shiflet
Range Conservationist, SCS, Alexandria, La.

THE marshlands of Louisiana's gulf coast are indeed a strange world. Productive and teeming with life, they have frustrated many landowners' efforts to turn them to profitable use.

Cultivation of marshlands is of doubtful practicality; some experiences have been little short of disastrous. If fresh marshes with peat surfaces are cultivated, they shrink. Some of them have been used for the production of rice—and some still are, but with questionable success.

Their value as a wildlife habitat, of course, is well established.

But Raywood Mouton, Esther, La., thinks he has the answer.

He has a 70-acre marsh area which his conservation plan shows to be land of capability class VII (suitable only for permanent vegetation with severe restrictions on use). The limiting factor is the depth of peat surface to mineral soil. It is more than 9 inches deep —too deep for cultivation although firm enough to support cattle. A portion of the tract was once farmed to rice but that enterprise was abandoned.

Grow Paille Fine

In 1962, SCS conservationists assisting the Iberia-Vermilion Soil and Water Conservation District helped Mouton find a way to use the marsh. They pointed out that this land would produce some of the finest native grass in Louisiana. The principal species in the area is paille fine (pronounced pi-feen) which is highly productive and grows on a wide range of marsh soils. It produces as much as 5 tons of air-dry forage an acre and is very high in protein.

The conservationists suggested grazing under a conservation plan that keeps livestock numbers carefully balanced with forage production and maintains the stand of desirable grasses.

Now Mouton runs an average of 60 animal-units on this 70 acres for 8 months of the year. The rest of the time, October 1 to February 1, the cattle graze rice stubble and bermuda and clover pastures.

Grazing native marshland has its advantages over more intensive livestock production on tame pastures and cropland. Improved pastures on better land require liming, fertilizing, mowing, periodic renovation, and other practices. These costs have to be deducted from gross income. But paille fine needs only proper stocking and management; it does the rest.

There are, however, some costs to producing range forage on this marsh. Rainfall must be pumped off because former cultivation has caused the peat soils to shrink, and the surface is lower than the canals and ditches. Without the system of levees and the pump, this would be a shallow intermittent lake. Pumping usually is not necessary on undisturbed marshes.

Use for Class VII Land

It's a familiar story to conservationists. Class VII land is best suited to grass or trees, and in this case it is grass. Using the marsh for range results in conservation of both soil and water resources. The thick growth of grass maintains the depth of peat and permits water levels that would otherwise have to be kept lowered by excessive pumping.

Mouton has farmed similar land to rice. He found cultivation to be expensive and uncertain. Comparing his net profits, Mouton figures he gets about $8 an acre a year more from grass than from rice. ♦

Paille fine provides the principal forage for cattle grazing on Raymond Mouton's fresh marsh range.

Contractors Help Speed Woodland Improvement in Northeastern Ohio

By Paul A. Dodd
Work Unit Conservationist, SCS, Ravenna, Ohio

GETTING landowners to improve their woodlands has been a problem for the Portage Soil Conservation District in northeastern Ohio. They have found their answer in the woodland contractor.

The contractor idea for northeastern Ohio was first explored in 1961 at a joint meeting of the farm foresters of the Ohio Division of Forestry and personnel of the Soil Conservation Service from nine counties. At least one potential contractor was invited from each county.

Woodland Contractor Mahlon Carlisle girdles an undesirable tree.

Supervisors of the Portage District had long believed that woodland improvement was being neglected by landowners, and the Conservation Needs Inventory proved they were right. The inventory showed that of 76,600 woodland acres in the county, 66,000 needed conservation treatment. To meet this need by 1975, more than 5,000 acres would have to be treated each year; but the yearly average had been only about 100 acres.

Inventory Showed Need

The local SCS office began emphasizing woodland work in its public information, and the district published the inventory to show the need for this and other practices. Despite the emphasis, only 114 acres of woodland was treated in 1960. At this point the district urged the meeting to discuss ways to solve the problem.

At the meeting, it was decided that the woodland work could be done on a contract basis at low cost to the landowner. Some potential contractors attended the meeting, and a brief training session was held. Several of the men entered the contracting business as a result.

Mahlon Carlisle of New Milford, for example, did nine contracting jobs in Stark and Portage counties in 1963. This was proof enough to the Portage District that contracting was a feasible way of getting more woodland improvement on the land.

Field Day Held

Last year the Portage District gave major emphasis to woodland improvement in its annual program. A coordinated information program was set up by the Ohio farm forester, SCS, and the Cooperative Extension Service that included newspaper and newsletter articles and radio spots about the contracting services available. A forestry field day was held.

Results of these efforts were immediate and dramatic. In 1964, Mr. Carlisle alone contracted more than 20 jobs in Portage County. One of his customers was Noble Hopkins, chairman of the Portage District, whose 21-acre woodlot had a grapevine and cull tree problem. Mr. Hopkins, like most of his neighbors, had been putting off improving his woodlot because other jobs around the farm seemed more important.

Carlisle did the job for the cost estimate, prepared by the farm forester, of $31 an acre or a total of $654. The Agricultural Stabilization and Conservation Service shared $492 of the cost. The grapevines were skinned and poisoned, and cull trees were cut or deadened and left standing.

Salvage Pays for Work

The contractor does not haul out the cut trees under the contract. But if any of the trees are merchantable as timber, blocking, or firewood, he sometimes reaches a separate agreement on the sale and use of the material. Some landowners have paid most or all of their share of the improvement cost by selling the timber to the contractor, who has contacts with buyers.

What equipment does the woodland contractor need? Power saw, axe, and a spray are starters. A truck and a team of horses to haul out the logs are helpful. A tractor is needed if the contractor does tree planting work on open areas.

Portage County woodland owners are pleased to have contractors available who can do the woodland work they need. ♦

U.S. farmers owned 4.5 million tractors in 1964. Tractors have displaced 22 million work animals and 76 million acres that would have been needed to grow feed for them. ♦

Conservation Design Tames The Old Cataract Ditch

By Neal P. McKinstry
Work Unit Conservationist, SCS, Craig, Colo.

THE mountain water of Cataract Ditch drops 1,200 feet in 5 miles on its way to the irrigated valley meadows of Moffat County, Colo. En route it picks up an erosion load of gravel, sand, silt, and clay that ends up in ranch laterals and on fertile fields.

Over the years these deposits had sealed the soils against air and water and were responsible for a 50 percent drop in hay production, in an area where winter feed reserves are sorely needed.

Donald Pelley and his sons, Estel and Jim, saw what was happening to the 310 irrigated acres they depend on and resolved to do something about it. So did the Hillewaert brothers, John, Frank, and Alphonso. More than 400 acres of their meadow was being suffocated.

A Roving Ditch

The neighbors moved sections of the ditch from one swale to another. But each time new gullies formed with the same disastrous results — erosion along the steep routes, deposits on the level land.

The Pelleys and Hillewaerts signed an agreement with the Moffat Soil Conservation District for the technical help they needed.

Preliminary surveys by the local SCS staff ruled out the practicability of using pipelines or flumes to carry the water through eroded areas. The ranchers just couldn't afford the mile and a half of big conduit that would be needed.

The only solution seemed to hinge on finding a rocky draw where the water could be dropped safe from erosion.

Cedar Draw on the Hillewaert place seemed like the best possibility, since one of its tributaries headed on the mesa about a quarter mile from the upper reaches of the ditch. But three or four stretches along the Cedar Draw looked like weak spots that might start washing. If so, the entire system would be no better than those now abandoned.

A Safe Route

According to a plan evolved by the conservationist, the Pelleys and Hillewaerts could guard against this hazard by using a series of gradient ditches in the McInturff Mesa area to take the water to the head of a lava rock hillside, there to be spilled into Cedar Draw. After the plunge down the draw, the water would be diverted into

Secretary-Treasurer of the Moffat Soil Conservation District, Robert Miller, inspects the chasm cut by the old Cataract Ditch before its renovation.

A well-formed lateral ditch (l.), cut with a backhoe, replaces the active gully cut by water running downhill without control from the original Cataract Ditch.

a new 13,635-foot canal. This would carry the water to the Pelley meadows and to part of the Hillewaert fields. A second canal would route water to other Hillewaert fields 2 miles on the opposite side of the draw.

Control structures would be needed, too, the plans showed. These would include combination diversion dam division boxes and diversion gates in Cedar Draw as well as division boxes in the canal.

The practical solution to crossing many of the draws at the base of the mesa appeared to be dams across each drainage. These were eventually built with pipes and sodded spillways to allow floodwater to escape without harming the canal or improvements.

In October 1961, Harland Ross, SCS conservation engineering technician, completed designs, and the ranchers ordered the construction started.

The dirt work was done with Pelley's bulldozer at first. But deep-rooted lava offered stubborn resistance. There were other interruptions, including a forest fire, yet 2½ miles of ditch was finished, and more than 22,440 cubic yards of earth and rock were moved.

A Finished Job

It was apparent, though, that the dozer would not get the ditches finished in time to save the 1964 hay crop. So the Hillewaert brothers hired a conservation contractor to help.

Work went faster when the contractor began using a back-hoe with "wings" welded to the bucket to form the ditch. The machine traveled a road bulldozed along the hillside. At each pass, it cut a section, perfectly formed, 18 inches across the bottom and with 1½:1 side slopes.

The new Cataract Ditch was put into full service for the 1964 season. For once the Pelleys and Hillewaerts said they were irrigating with water, not mud. ♦

Appalachian Problems

(Continued from p. 269)

trees, woodland as a land use must have a major part in any responsible program for the area.

The forest was clear cut when first exploited. Tens of thousands of acres that should never have been cleared was cropped and pastured until depleted by soil erosion.

Second growth timber is often poorly managed. Forest fires are a common sight. Poor forest cover, eroding logging roads, and sale of timber by tract rather than by volume all contribute to the poor condition of the watersheds.

Economic pressure on the subsistence farmer results in cutting of trees as small as 4 inches in diameter. His future is now; he lives in the present with scant hope that tomorrow will better his lot.

Burned woods, eroded farmlands, coal mine spoil banks, and polluted streams make a poor habitat for wildlife. Water for wildlife is scarce in the higher elevations.

Population began growing in the early 1900's with the rapidly expanding coal and timber industries. In places the population density rose to about 340 persons per square mile of habitable area.

Buildings Take Farmland

The building of railroads, lumber and coal mining camps, and settlers' homes took up many acres of farmland and resulted in clearing of hillsides for crops. When erosion made the hill land unproductive, it was abandoned and farmers cleared even less desirable mountain slopes.

The location of residential areas, railroads, and roads in the mountain valleys now makes it difficult for local communities to participate in the small watershed program, because the necessary easements and rights-of-way often cannot be obtained.

The flow of population turned during World War II, and since then, the rate of out-migration has been rapid. Even so, a large part of the population probably will elect to remain in the mountains, although coal mining and lumbering both have proved to be undependable and inadequate sources of employment, even in areas richest in coal and timber.

The area has many problems of health, education, unemployment, personal income, and living standards in addition to those relating to agriculture and natural resources. All are interrelated.

What can the school girl say of the future in her essay on soil conservation? It is true, as her reference materials tell her, that the hope of her family and her community depend on the conservation and development of the soil and water, and other natural resources, of the area.

But the land and water problems of Appalachia cannot be solved on a piecemeal or field-by-field basis. A complete land use and treatment program needs to be developed through a conservation plan and applied on the entire holding of each landowner, then over the small watersheds in the area, and finally to the major watersheds.

The landowners of eastern Kentucky have organized to do what they can to solve their problems. Soil conservation districts cover the area as do multi-county Rural Areas Development Councils. Most individual counties have RAD associations.

These people have demonstrated their willingness to do what they can with what they have, but too often what they have is not enough. For example, the majority of soil conservation district cooperators are financially unable to establish practices recorded in their conservation plans, even with the help of ACP cost-sharing.

There is real hope that the Appalachian Regional Development Act will accelerate going programs for wise use and treatment of soil and water.

Then the years ahead may see our school girl, well-dressed and well-nourished, graduating with her class from a school with modern buildings and equipment and eventually establishing a pleasant home in a prosperous valley town.

The lessons she learns in writing her conservation essay are crucial lessons for all the people of Appalachia. ♦

Tennessee Community School Provides A Study in Conservation at Work

By E. B. Dyer, Jr.
Work Unit Conservationist, SCS, Elizabethton, Tenn.

THE Unaka High School in the Watauga Valley community of Carter County, Tenn., offers its 400 students more than the usual educational advantages of a modern building with cafeteria, gymnasium, library, and shops.

Behind the new building is a 40-acre forest of pine and hardwoods, an outdoor laboratory for students of biology, general science, and agriculture. Vocational agriculture students have laid out a nature trail and marked and identified the trees. Biology students have a place to study plants, animals, minerals, and other features of the natural landscape.

The school will share this treasure. Plans call for a Boy Scout camp and a community picnic area.

On another 30 acres the school and community leaders have developed a soil and water conservation workshop in cooperation with the Carter County Soil Conservation District.

Successful Campaign

The Watauga Valley Community Club, a local member of the school board, and other leaders competed with other communities for the proposed new high school, and won.

When the contractors moved away, the beautiful new building sat in an unsightly field of raw and exposed soil. Rocks and boulders showed everywhere.

The rains came and runoff water carried mud from the barren area. Storm sewers filled, and mud flowed into the schoolhouse.

It was then that County School Superintendent Tommy Neece and J. R. Garland, chairman of the Carter County Board of Education, asked for help from the Carter County District. Principal J. E. Taylor and John Morgan, the vocational agriculture teacher, and the vo-ag students joined the team that worked with the local SCS conservationist in developing a conservation plan.

First Experience

Many students gained their first experience with conservation planning based on a inventory of soil resources. Fertilizer, lime, and planting materials were supplied from money raised by the community club, Parent-Teachers Association, and the school board.

The project became a working class in soil conservation. Students planted fescue, ryegrass, and clover, and then applied a straw mulch. Steeper slopes were protected with flocks, periwinkle, and shrubs, as well as grass. Trees and

The Unaka campus is backed by the school forest that was turned into an experimental study to determine tree species best adapted to the site. The foreground is graded and planted to control erosion.

Unaka students plant pine trees in experimental plot on school grounds. The students planted 5,000 seedlings.

ornamental plants helped to beautify the campus.

A waterway was shaped and sodded to receive water from a diversion terrace to be built later. A system of tile drains was designed and installed to relieve an area of water-soaked bottom land in front of the school. Then baseball and football fields were built on land that was formerly too swampy.

With the most urgent parts of the conservation program behind them, the students turned their attention to the 40-acre woodland. A woodland inventory and management plan were made with assistance from Ted Melton, Tennessee State service forester.

Educators Approve

"This is one of the outstanding examples of how conservation education has become more than just a theory," said George Worley, president of the Conservation Education Association, after visiting the school with 300 educators attending the national convention at nearby East Tennessee State University in 1963. "This campus is a living example of people accomplishing conservation of natural resources through teamwork."

"When schools, teachers, and communities become interested in using our natural resources wisely —then and only then can conservation become effective," added Roe Warren, chairman of the board of supervisors of the soil conservation district. ♦

Grass Seeding Pays off on Kansas Estate

SEEDING native grasses on old cropland doubled the rangeland acres on the A. J. Rice Estate in Graham County, Kans.

Before 1957 J. B. and Jim Cameron farmed almost 2,000 of the 3,000 Rice Estates acres. Today they farm less than a thousand and run cattle on the remainder.

The first seedings were made in 1957 when they "banked" 450 acres of eroded cropland under the Soil Bank Program.

To finish the conservation job as soon as possible on his part of the estate land, J. B. Cameron filed the first application in Graham County for help under the Great Plains Conservation Program. He completed his conservation plan and signed the contract in 1959.

Jim Cameron placed his 640 acres under contract a year later. Both plans were completed and the contracts expired in 1963.

The two plans scheduled grass seeding on 614 acres in addition to the Soil Bank land. Most of the area was Class VI land.

Says J. B. Cameron, "Some of the eroded land would not grow enough crops to pay for the gasoline used to farm it. It's strange how good the grass is on land that wouldn't grow anything else. We planted one field to feed, and it didn't get big enough to harvest, even with normal rainfall. Yet, the grass in that same field will probably feed a cow to 8 acres in the driest years."

To keep the grassland in top

condition they plan to maintain a cow herd of 200 to 225 head, depending on the growth of the grass.

The Kansas Bankers Association recognized the Camerons early in 1964 for their outstanding conservation work on completion of the Great Plains plans.—ARTHUR W. POPE, *Work Unit Conservationist, SCS, Hill City, Kans.*

Pasture-Hay Program Makes Dairy Farm Pay

WHEN you get 17,000 pounds of milk and 650 pounds of butterfat a head from your milkers, you've got something good going for you.

That's the way Darrell Kerby's 65 Holstein cows score today. And it's all due, he says, to sound management of pastures and a rebuilt irrigation system.

Kerby's 135-acre dairy is on the Clearwater River near Cherry Lanes, upstream from Spaulding, Idaho. It's an area famed now for its dams and wanigan log runs. But in the early 1900's, and for some years after, Cherry Lanes' orchards were top cherry producers.

The orchards have long since vanished and the land is now in hay and pastures.

When in 1952, Kerby, a former county agent and University of Idaho graduate, and his brother took over the farm, he realized a life-long dream. But right off, they ran into problems that kept them from moving ahead with their dairy plans.

The 14-year-old 1½ miles of welded steel irrigation mainline was corroded and needed to be replaced. And the onsite bank pumping station couldn't be used until log running was over each summer —usually well past the season when crops needed irrigating.

In 1960, Kerby took over the dairy and began reorganizing the old irrigation system as a cooperator with the Nez Perce Soil Conservation District. With Agricultural Conservation Program cost-sharing funds, he replaced the rusty mainline with galvanized steel pipe.

Next, he built a permanent pumping station, following a design prepared by the Soil Conservation Service. It operates from a sump located at a safe distance and height from log and ice jams in the river.

He is carrying out other conservation work on his dairy land. Crops are rotated on a 5-year basis. He green-chops alfalfa and gets six cuttings a year.

To keep a high quality of forage he renovates the hayland-pasture every 5 years. He plows 20 to 30 acres of sod each year and plants back the same year.

He says, "The high milk output of our cows is due largely to feeding unmatured green legumes from April 1 to November of each year." —HOMER C. MOORE, *Area Engineer, SCS, Moscow, Idaho.* ♦

Land Capability

About half of the Nation's non-Federal rural land is suitable for cultivation. The other half is better suited to uses that keep it in permanent vegetation.

Classification by land capability in the National Inventory of Soil and Water Conservation Needs shows that 44 percent or 637 million acres is suitable for regular cultivation (class I-III); 12 percent or 169 million acres is marginal and is suitable for occasional or limited cultivation (class IV); and 44 percent or 641 million acres is generally not suitable for cultivation (class V-VIII). ♦

In 1870, 1 farm worker in the United States produced enough food for 5½ persons. At the beginning of World War II, the figure was 10½. Today 1 American farmworker is producing enough food for 30 people. ♦

What Do Retired Conservationists Do?

DID you ever wonder what a retired conservationist does? Since John Aycock retired from the Soil Conservation Service some 2 years ago, he has become a full time conservation farmer. John spent more than 30 years assisting and encouraging others to control erosion and develop their soil and water resources on west Tennessee farms.

John enjoys daily activity on his 200-acre farm near Millington, Tenn. His program includes cotton, corn, soybeans, and livestock. The row crops are placed on the best class II land on the place. Waterways are well kept for the removal of excess water, and hay is harvested from these areas. These crops are rotated with a grass-legume mixture which does a good job of maintaining soil fertility as well as organic matter.

The uplands on John's farm are in tall fescue, Coastal bermudagrass, and common bermudagrass, overseeded with lespedeza. These varieties provide an abundance of pasture for his herd of Shorthorn cattle. John maintains close watch to make certain that pastures are not overgrazed and that grasses make sufficient growth so that cattle can graze almost the year-round. Excess growth is cut and stored.

Wildlife areas on the Aycock farm are protected by a fence to provide a quiet place for birds to nest or rabbits to raise their young. Other areas are protected with multiflora rose to separate cropland and pasture and to provide useful and scenic wildlife habitat.

John is practicing what he preached for so many years and is realizing a good return financially as well as the satisfaction of a job well done—T. F. JONES, *Work Unit Conservationist, SCS, Memphis, Tenn.* ♦

The Economic Demand for Irrigated Acreage. By Vernon W. Ruttan. *1965. Resources for the Future, Washington, D.C. (Johns Hopkins Press, Baltimore). 139 pp., charts. $4.*

The subtitle, "New Methodology and Some Preliminary Projections, 1954-80," points up the main subject of the book. It is to describe and illustrate a new set of "flexible elasticity" models for estimating relative profitability of investment in irrigation in different areas and under different conditions.

The mathematical descriptions of the models and discussion of the theory underlying them, which make up much of the book, will be of interest mainly to technical economists. All readers concerned with water resource use, however, will be interested in the resulting projections and comparisons with those made by other methods.

Traditionally, irrigation claims more than 90 percent of all the water used in the Western States. But rising demands for urban, industrial, and recreational uses offer increasing competition for the limited supply. A reliable method of indicating optimum choices among alternative policies in water use would be a welcome tool to resource planners.

The results of the elasticity models are considered to be a better indication of future developments than the estimates of "requirements" to meet assumed levels of production, as used by the Department of Agriculture and Bureau of Reclamation for the Senate Select Committee on National Water Resources. In general, they are higher than the "high" projections of USDA and lower than those of the Bureau of Reclamation.

These estimates also suggest that land and water development in the subhumid East may be more economical than extension of irrigation in the more arid regions of the West where other uses of water would have higher value.—B.O.

New Publications

Soil-Temperature Regimes — their Characteristics and Predictability. By Guy D. Smith, Franklin Newhall, Luther H. Robinson, and Dwight Swanson. *1964. USDA SCS-TP-144. 14 pp., charts.* A review of available information mainly from the United States and Puerto Rico, including examples from many countries and climates. Soil temperature is one of the important environmental factors affecting plant growth that is considered in the new soil classification. For most practical purposes, the temperature regime can be described by the mean annual soil temperature, the average seasonal fluctuations from that mean, and the mean warm and cold seasonal soil-temperature gradient in the root zone. This paper summarizes data on these soil properties.

Research on Water. *1964. Soil Science Society of America, Madison, Wis. Spec. Pub. 4. 121 pp., illus. $1.50.* Thirteen short papers presented as a symposium cosponsored by the Soil Conservation Society of America at the 1963 annual meeting of the Soil Science Society of America at Denver, Colo. One is by an SCS author, John T. Phelan of the Engineering Division, on farm use of irrigation water. Others cover a wide range of research interests.

Sagebrush Control on Rangelands. By Joseph F. Pechanec, A. Perry Plummer, Joseph H. Robertson, and A. C. Hull, Jr. *1965. USDA Agr. Hbk. 277. 40 pp., illus.* A well-illustrated handbook on methods of controlling sagebrush, management of ranges after sagebrush control, and a listing of common and scientific names of the plant species. Supercedes Farmers' Bulletin 2072.

Conservation Methods for Soils of the Ontario-Mohawk Plain and Glaciated Allegheny Plateau. By G. R. Free. *1965. USDA Agr. Inf. Bul. 291. 16 pp., illus.* Information giving general description of the area; conservation problems; effect of topography, soils, and seasons on runoff and erosion; and soil and water management practices for conservation.

Pesticides Documentation Bulletin. Volume 1, Number 1. *March 19, 1965. USDA. National Agricultural Library. 156 pp. Biweekly.* A computer-produced inventory of current literature on pesticides. Free on request to libraries, educational and scientific institutions, Federal and State officials, and others. Subscription $12 a year domestic, $15 foreign.

Agronomy in the Americas. *1964. American Society of Agronomy, Madison, Wis. ASA Spec. Pub. 2. 60 pp. $1.* A symposium presented at the 1963 annual meeting of ASA. The papers discuss various aspects of agricultural research, extension, and education in Latin America and relations to the United States.

Income Opportunities for Rural Families From Outdoor Recreation Enterprises. By Ronald Bird and Buis T. Inman. *1965. USDA Agr. Econ. Rpt. 68. 31 pp.* Summarization of data from studies on recreational enterprises in Arkansas, Missouri, New England, Ohio, Oregon, and South Carolina.

Quest for Quality. *1965. U. S. Department of the Interior. 96 pp., illus.; color. $1.* Subtitled "Conservation Yearbook," this outsize publication states the conservation goals and describes the activities of the bureaus of the Department of the Interior.

Protecting Shade Trees during Home Construction. By Agricultural Research Service. *1965. USDA Home and Garden Bul. 104. 8 pp., illus.* Suggestions on evaluating trees and hints for protecting them.

Chemical Control of Brush and Trees. By Agricultural Research Service. *1964. USDA Farmers' Bul. 2158. 23 pp., illus.* Up-to-date information on herbicides and their application.

Usual Planting and Harvesting Dates. By Statistical Reporting Service. *1965. USDA Agr. Hbk. 283. 84 pp., maps.* Field and seed crops, by States in principal producing areas.

Herbicide Manual for Noncropland Weeds. By R. S. Dunham. *1965. USDA Agr. Bbk. 269. 90 pp.* ♦

In the 1700's there were 600 acres of land for every man, woman, and child. Today, there are 13 acres, and in 25 years there will be only 8 acres. ♦

From the Administrator:

The Cost of Sediment

EVERY year sedimentation—a byproduct of soil erosion—costs us dearly.

More than 737 million acres of non-Federal land in rural America is susceptible to erosion. This land is a potential source of sediment that runs off into streams, limits storage capacity of reservoirs, plugs stream channels causing them to overflow, pollutes our water, and brings about untold damage and destruction.

Large-scale suburban construction also feeds silt into streams when soil is left bare and exposed to rains and subsequent erosion. Most suburban developers do not think in terms of soil and water conservation. Yet land in areas they are developing may be exposed anywhere from a few months to 2 or 3 years, and it needs protection during that time.

Highway construction, criss-crossing the Nation, opens up large areas of land to the mercy of the rain and wind. It is true that today roadside erosion control and beautification are often part of highway planning. Unfortunately, however, the plans do not usually include soil conservation work early in the construction stage. Yet this is when temporary vegetation and other conservation measures are needed if the area is not to become a sediment source.

If soil erosion is not controlled—in city, town, or country—sediment reaches our reservoirs and streams, where it has become the largest single pollutant. Nor can railroads and highways, recreation areas, sewerlines and wells, or airports escape. And sediment enters homes, stores, and factories with the swirling water of floods. They too are victims when land is left unprotected.

Many of our streams—once scenes of unmatched beauty for all to enjoy and affording relaxation to the fisherman and swimmer—now are shameful sights. Sediment and other pollutants have made them unfit for human use and uninhabitable by game fish.

Much to our chagrin in the Nation's Capital, the Potomac is one of those rivers. President Lyndon B. Johnson has appealed for an all-out campaign to clear up the Potomac and keep it clean. He hopes to see it become "a model of scenic and recreation values for the entire country." I look forward to the SCS taking a part in this campaign.

If a program to rid our streams of pollution is to be successful—on the Potomac or elsewhere—it must include control of soil erosion as well as control of industrial chemicals and urban waste. And sedimentation from nonfarm rural and urban land becomes more of a problem as city, industrial, and highway construction spreads out.

To deal with the sedimentation and pollution problems may require local land use and building regulations based on soil and water conservation planning. It may call for regulations requiring temporary conservation measures during lengthy construction operations. Certainly local planners will need to work closely with soil conservation specialists. For erosion control should be as much a part of urban planning as sewage disposal and water supply.

Congressmen have shown their concern where rapid urbanization is taking place. They urge that the Department of Agriculture be authorized to cooperate with local people in protecting and developing the soil and water resources of such areas.

The Soil Conservation Service has been helping farmers do this successfully for 30 years. More recently we have been helping suburban planners, builders, and other nonfarm land users. But far too few recognize that conservation should be basic to all land use and development, no matter where. The same skills and techniques that farmers have proved sound can be adapted for use on nonfarm lands.

These are some of the sedimentation problems our Nation faces today. They are serious problems. They affect everyone. The cost of apathy is tremendous for everyone is a taxpayer. The cost, of course, cannot be figured in monetary values alone, for no one can pay for the loss of land and water.

The average citzien, however, is not likely to connect readily the need for erosion control upstream with the inconveniences and cost that result from the aftermath of that erosion.

There is urgent need for action. What that action will be must be decided by local people. The Soil Conservation Service provides help through soil and water conservation districts, watershed projects, soil surveys, and other conservation programs.

Ultimately, the job rests upon the shoulders of those who plan for the use and care of our land and water resources. It is up to them to see that careful plans are made—and carried out—for the conservation and protection of these resources on every acre of our Nation.

However, if the responsible people are to do the job, all citizens must become aware of the seriousness of the problem and recognize its source. Finally, they must give their active support to its solution.

—D. A. WILLIAMS

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Recreation and Livestock Make a Happy Combination

THE Joe Mannings of North Dakota joined the golfing world when they converted 100 acres of valley land on their farm near Hettinger to a nine-hole golf course.

In addition to the course, they built a small landing strip for light planes, a driving range, and a picnic area, and left ample room for softball and horseshoe pitching. A tennis court and swimming pool are in the Manning plans. And they still keep livestock on their rangeland.

They decided on the change 3 years ago when fire destroyed the Hettinger Golf Club.

Mr. Manning had considered developing the valley land on his farm for recreation. Now, he thought, was his chance. His single-row windbreaks and the strips of land between them, planted according to a conservation plan in cooperation with the Adams County Soil Conservation District, seemed perfect for a golf course. He would not have to cut a tree, and the other facilities would round out a pleasant group of activities for prospective club members.

His clubhouse is unusual. Well and basement were dug by experienced crews, but most of the other work was done by the Mannings and their neighbors.

Mrs. Manning supervises the kitchen and dining room. Those facilities are much in demand. Here, too, the three young Manning daughters and a son lend a willing hand, and the son also helps with the rest of the farm.

Of course, there is indebtedness which must be retired, but Mr. Manning has no real worry about that. Early response has been good, and he is sure it will grow. There are 107 members of the club now. They joined at $40 each, half of them nongolfers who wanted only the social privileges of the club.

The Manning cropland is in the Conservation Reserve, and there is income from the livestock.

He and the others in the family are thoroughly enjoying themselves. They like people, and the club members like them. It has turned out to be a most satisfactory change that the Mannings made—and indications are it will be comfortably profitable, too.—GILBERT F. SCHWANDT, *Work Unit Conservationist, SCS, New England, N. Dak.* ♦

Joe Manning developed this golf course to supplement his farm income.

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SOIL CONSERVATION

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August 1964 to July 1965

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